

AMENDMENT TO THE CLAIMS

1. (currently amended) A temperature regulated, enclosed intrinsically safe electrical energy storage cell pack for an intrinsically safe hand held portable instrument in an industrial process control system, comprising:

a plurality of electrical energy storage cells wherein the electrical energy storage cells are elongate and aligned parallel to one another and side by side;

a plurality of electrical interconnects arranged to electrically connect adjacent electrical energy storage cells;

electrical leads which couple the plurality of electrical energy storage cells to the intrinsically safe hand held instrument;

a plurality of elongated separation bars positioned between the adjacent electrical energy storage cells and between the plurality of electrical interconnects to thereby reduce shorting and provide mechanical support;

a plurality of opposed first and second half shellshells forming a plurality of half shell pairs, each half shell pair positioned in physical contact with opposing sides of one of the plurality of electrical storage cells, ~~the~~each half shellshell pair having a gap therebetween to allow thermal expansion of the half shells during heating, the first and second half shells extending in a parallel planes and enclosing the plurality of electrical energy storage cells, each half shell comprising:

an interior layer of thermally conductive material that is shaped to conform to a cylindrical portion of an outer surface of the electrical energy storage cells, the interior layer terminating at interior layer ends that are on the cylindrical portion of the outer surface of the electrical energy storage cells, and the interior layer having a first thickness and a first value of thermal conductivity;

~~an outer layer of thermally insulating material that is shaped to form an enclosure of an outer surface of the interior layer, contacts all of the outer surface of the interior layer, and that extends beyond the outer surface to enclose the interior layer ends;~~

a plurality of outer elastic layers extending around pairs of opposed first and second half shells configured to hold pairs of first and second half shells against a respective energy storage cell, the plurality of outer elastic layers of a thermally insulating material, wherein the outer layers define an exterior surface of the enclosure of the electrical energy storage cell which separates the electrical energy storage cell pack from the explosive environment, the outer layers having a second thickness and a second value of thermal conductivity; and the first and second thicknesses and the first and second values of thermal conductivity conforming the enclosed electrical energy storage cells to a combustible atmosphere temperature classification that specifies an outer surface temperature during an electrical short circuit of an electrical energy storage cell, the enclosure controlling the outer surface temperature of the combined enclosure and electrical energy storage cells such that the temperature regulated, enclosed electrical energy storage cell pack comprises intrinsically safe equipment in the explosive environment;

a protective device including a fusible link coupled to a connected lead and the electrical storage cells which is encased in potting compound; ~~and~~

an outer shell covering the plurality of electrical energy storage cells and coupled to the plurality of elongate separate bars; and

wherein an exterior temperature of the outer layer is less than 130°C during the electrical short circuit of the electrical energy storage cell.

2. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the electrical energy storage cell produces heat at a hot spot during the short circuit and the interior layer of material spreads flow of the heat over a portion of the outer surface of the interior layer that is larger than the hot spot and the outer layer of material retards flow of the heat to an outer surface of the outer layer.

3. (currently amended) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the temperature of the outer surface of the outer ~~layer~~layers has a measured maximum temperature of 130 degrees centigrade or less during the short circuit condition.

4. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the interior layer of material comprises aluminum.

5. (previously presented) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the interior layer of material comprises copper.

6. (currently amended) The temperature regulated, enclosed electrical energy storage cell pack of Claim 1 wherein the outer ~~layers of material~~ comprises heat-shrink tubing.

7. (cancelled)

8. (cancelled)

Claims 9-35 (canceled)